

GASTROPODS FROM THE UKALUNDA BEDS AND DOUGLAS CREEK, EARLY DEVONIAN, NORTH QUEENSLAND

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Four gastropods are recognised from the Ukalunda Beds and related sediments from Douglas Creek, Early Devonian north Queensland. This endemic fauna comprises *Tropidodiscus foliatus* sp. nov., *Trochonema (Eunema)* sp., *Kitikamispira ukalundensis* sp. nov., and *Hornzyga camilleriae* gen. et sp. nov. *Hornzyga* gen. nov. is erected for palaeozygopleurids with coarse ribbing and a characteristic vertical subsutural surface on the upper whorl face. □ *Gastropods, Devonian, Emsian, Ukalunda Beds, Queensland.*

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Gastropods are subordinate components of many Devonian fossil assemblages in north Queensland. Diverse, and highly endemic gastropod faunas are known from the Middle Devonian of the Broken River and Burdekin Provinces (Heidecker, 1959; Cook, 1993b). This paper documents the gastropod fauna collected from the Ukalunda Beds and the siliciclastic sediments associated with the Douglas Creek Limestone. Brachiopod, coral, and conodont faunas have been documented from the Ukalunda Beds (Hill et al., 1967; Jell & Hill, 1969; Brock & Talent, 1993). Parfrey (1989) recorded a number of brachiopods, a single taxon of bivalve and an unidentified gastropod from outcrops of the Ukalunda Beds near Mount Coolon. Studies of the faunas of the Douglas Creek Limestone and related siliciclastic units to the immediate south have concentrated on the coralline, brachiopod and conodont faunas (Hill, 1939; Jones, 1941; Phillip & Pedder, 1967; Jell & Hill, 1970; Brock & Talent, 1993). A detailed record of the previous palaeontological work was provided by Brock & Talent (1993), who also discussed evidence for an Emsian age for both the Ukalunda beds and the Douglas Creek Limestone and related siltstones.

Recent stratigraphic mapping by Benedetto (1993) in the Pyramid area informally documented some of the molluscan taxa, namely *Nuculana* sp., *Parralellodon* sp., *Paracyclas* sp., *Leptodesma* sp., and gastropod indet. Study of Benedetto's material forms part of this work.

The four taxa described below are endemic to north Queensland, but there are generic-level links to faunas from New South Wales, northeast Japan and other old world realm faunules.

LOCALITIES AND MATERIALS

Material was collected by the Bureau of Mineral Resources (now AGSO), Macquarie University, Jarrod Benedick of James Cook University, Townsville, and staff of the Queensland Museum. Details of BMR localities have been recorded by Brock and Talent (1989). James Cook University localities are prefixed JCUL and are detailed in the Appendix along with Queensland Museum localities (QML). Material described herein is registered with the Commonwealth Palaeontological Collections (CPC), Queensland Museum (QMF) and James Cook University (JCUF).

SYSTEMATIC PALAEOLOGY

Phylum MOLLUSCA

Class GASTROPODA

Family BELLEROPHONTIDAE McCoy, 1851

Subfamily TROPIDODISCINAE Knight, 1956

Tropidodiscus Meek & Worthen, 1866

TYPE SPECIES

Tropidodiscus curvilineatus (Conrad) from the Lower Devonian of New York, by original designation.

Tropidodiscus foliatus sp. nov.

Fig. 1C-H

MATERIAL EXAMINED

HOLOTYPE: QMF32176 from QML1008.

PARATYPES: QMF32362-4 from QML1005. All material from the Ukalunda Beds, Pyramid Station and Mary Creek, Old Hidden Valley Station.

DIAGNOSIS

Carina well developed; growth lines coarse, well-spaced, foliaceous.

DESCRIPTION

Medium sized, isostrophic, doubly phaneromphalous, up to 12mm wide and 16mm in diameter, bearing a prominent dorsal carina which bears a deep v-shaped sinus. Whorl profile rounded from base of dorsal crest to a weak shoulder, then more strongly rounded into the umbilicus. Ornament consists of prominent, widely spaced foliaceous coarse growth lines, which are gently curved across the whorl profile and strongly inflected adapically at the dorsal crest, but this latter feature varies from early to later parts of the final whorl. Umbilicus deep; aperture expanded. The holotype is 5mm wide and 11mm in diameter.

REMARKS

Prominent dorsal angulation, and foliaceous growth ornament suggest affinity to *Temnodiscus*, but that genus is disjunctly-coiled. *Tropidodiscus cultricarinatus* Linsley, 1968 and *T. vesiculineatus* Linsley, 1968 from the Middle Devonian Anderdon Limestone, north America, both have the dorsal angulation, but lack the foliaceous growth ornament. The type species *T. curvilineatus* (Conrad), (see Knight, 1941) from the Lower Devonian of New York lacks the angulation and the foliaceous growth lines. *Tropidodiscus centrifugalis* (Chapman) of Tassell (1977) from the lower Devonian of Victoria, does not bear growth ornament as coarse as in the Ukalunda species. *Tropidodiscus (T.) nakazatensis* Kase & Nishida, 1986, from the Middle Devonian of northeast Japan is close in size and prominence of the carina, but the ornament is finer and the umbilicus narrower in the Japanese material.

ETYMOLOGY

Latin *foliatus*, leaved.

Family TROCHONEMATIDAE Zittel, 1895

Trochonema Salter, 1859

Trochonema (Eunema) Salter, 1859

TYPE SPECIES

Eunema strigillatum Salter from the Middle Ordovician Black River Group, Quebec, Canada.

***Trochonema (Eunema)* sp.**

Fig. 1A,B

MATERIAL EXAMINED

QMF33369-61 from QML1005, Mary Creek, Old Hidden Valley.

DESCRIPTION

Many-whorled, high-spined, gradate gastropod, greater than 35mm high and 22mm wide with an apical angle of approximately 35°. Suture canaliculate in two of the specimens, particularly in later whorls, with an angulation at its abaxial margin. Whorl profile dominated by a pair of widely spaced midwhorl carinae. A fourth carina is present on the lower whorl profile, but it is only known from the final whorl. Growth lines are fine, numerous, opisthocline on the upper whorl surface, a broad, weak sinus is present between the two midwhorl carina. Base and aperture unknown.

REMARKS

The canaliculate suture, the high-spined form and the broad weak sinus ally the material to the subgenus *T. (E.) strigillatum* (Salter), from the Ordovician Black River Group, as figured by Knight (1941), has stronger growth lines, and is disjunct in the final whorl. Widening of the canal in the final whorl of this material may be precursory to a disjunct whorl. The absence of material defining the apertural and basal features preclude a specific assignment for this material.

Family PALAEOTROCHIDAE Knight, 1956
Kitikamispira Kase & Nishida, 1988

TYPE SPECIES

Kitikamispira kaneoki, from the Middle Devonian (Eifelian) Nakazato Formation, Kitikami Mountains, northeast Japan, by original designation.

DIAGNOSIS

See Kase & Nishida (1988).

REMARKS

Kase & Nishida (1988) remarked on the similarities between *Burdikinia* Knight, 1937 and *Kitikamispira*. *Burdikinia burdekinensis* (Etheridge) is a substantially different form, having only the surface spines and large size as similarities. Kase & Nishida (1988) state that the type species, *K. kaneoki*, possesses only one row of spines on the upper whorl surface and four on

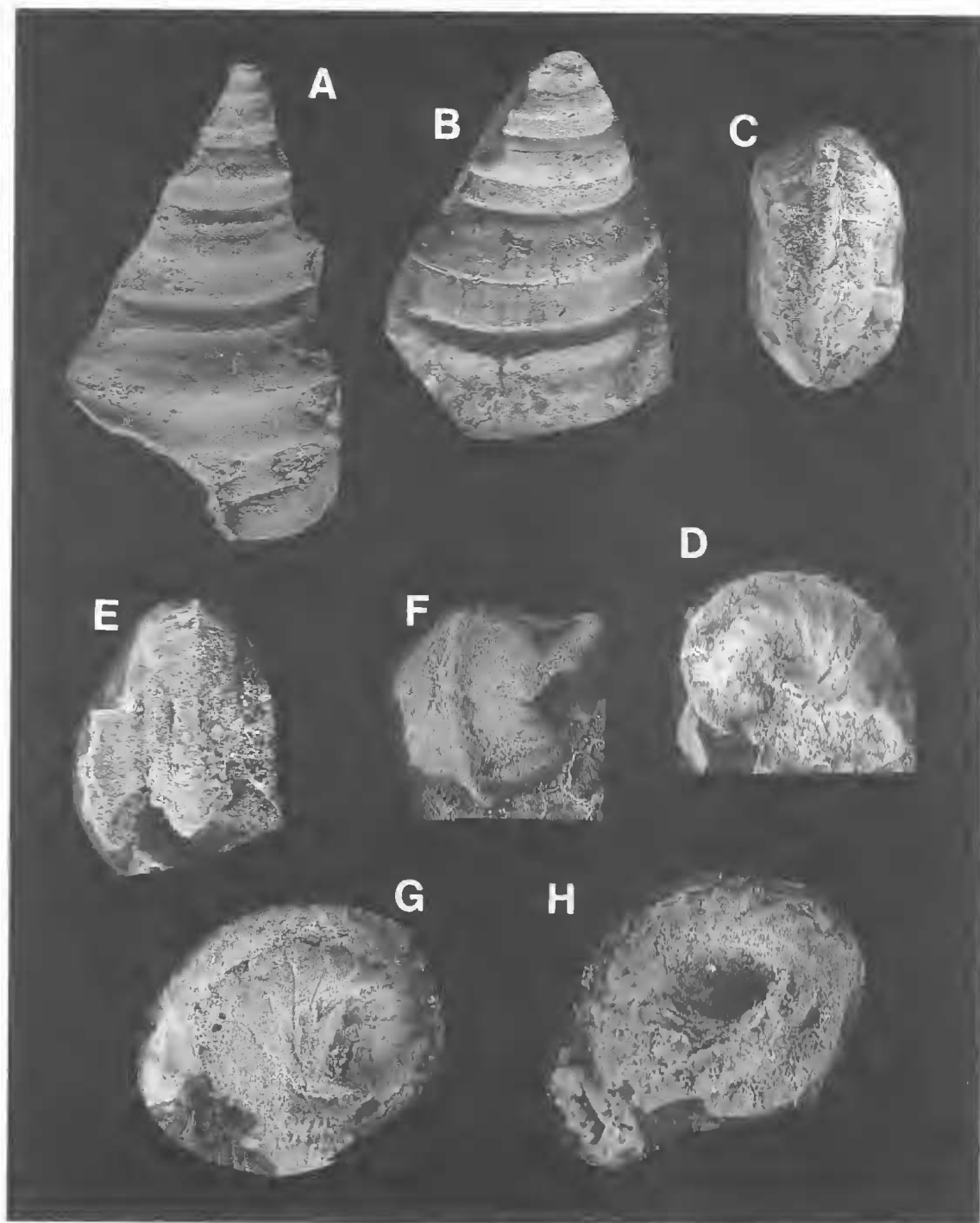


FIG. 1. A-B, *Trochonema (Eunema)* sp. A, latex mold of QMF33359 x 1.8. B, latex mold of QMF33360 x 1.8. Note the widening of canal in last preserved whorl. C-H, *Tropidodiscus foliatus* sp. nov. C, holotype QMF32176 apertural view, x 3. D, holotype QMF32176 side view x 2.8. E, latex mold of paratype QMF33364, apertural view x 2.5. F, latex mold of paratype QMF33367, oblique view x 2. G, latex mold of Paratype QMF33364, side view x 3. H, latex mold of paratype QMF33362, side view x 2.6.

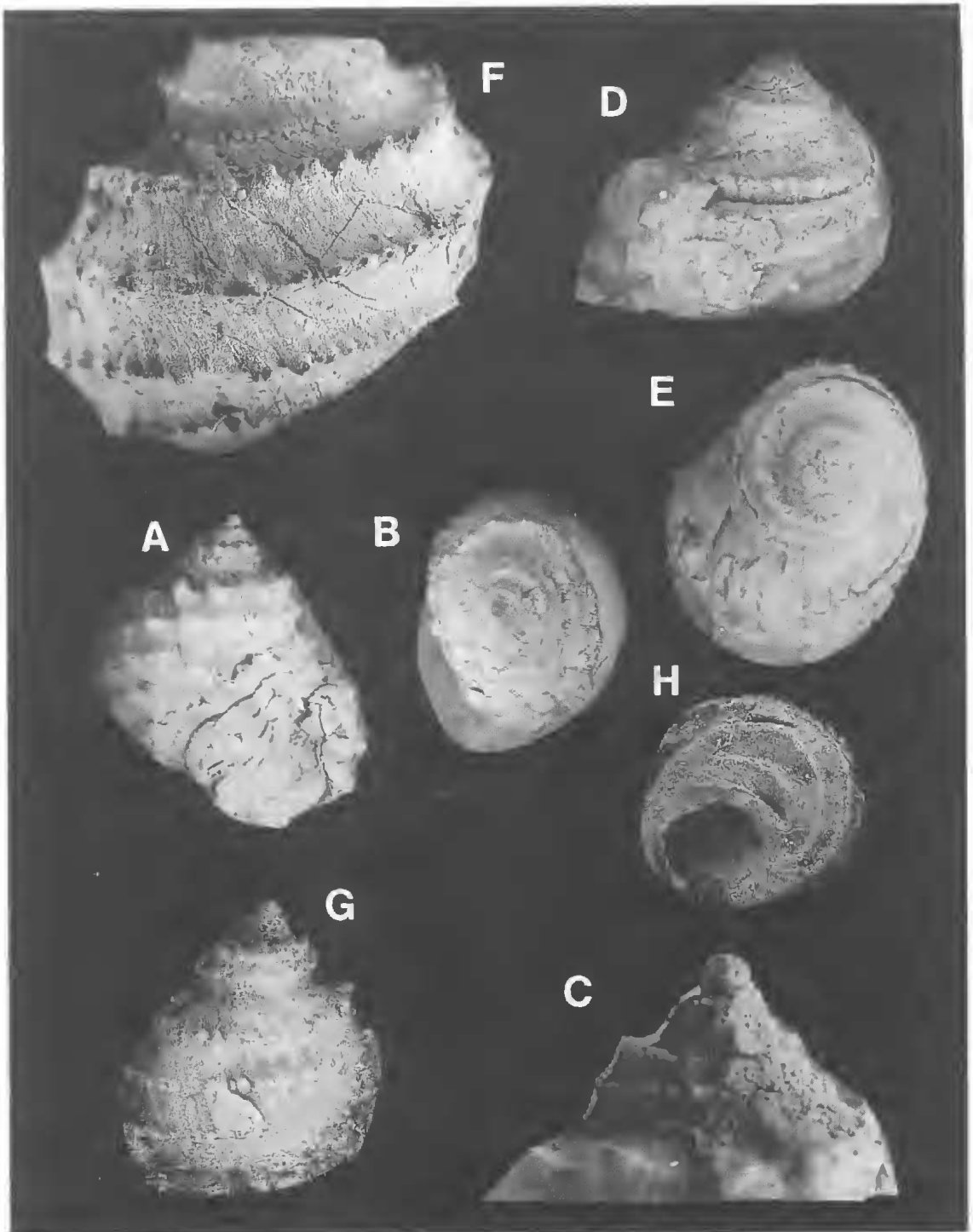


FIG. 2. A-H, *Kitikamispira ukalundensis* sp. nov. A-C, holotype QMF33358. A, apertural view x 2.7. B, apical view x 2.7. C, side view showing protoconch x 5. D, E, paratype QMF32179, side and apical views, x 2.8. F, latex mold of QMF33371 side view x 6.5. G, latex mold of paratype QMF 33354, side view x 2.8. H, latex mold of paratype QMF33372, basal view x 2.8.

the base, but their illustrations show one on the uppermost whorl surface, two on the midwhorl, and up to three on the lower whorl surface. *Ori-sotoma* Munier-Chalmas, 1876 is phan-cromphalus, but has a similar, if finer and more complex arrangement of spinose spiral cords. Kase & Nishida (1988) placed the genus within the Palaeotrochidae, apparently on the basis of the thickened shell and the thickened parietal region.

***Kitikamispira ukalundensis* sp. nov.**

Fig. 2

1989 Gastropod indet. Parfrey : 20.

MATERIAL EXAMINED

HOLOTYPE: QMF33358, from "loc 76", Mary Creek Old Hidden Valley, collected J. A. Talent.

PARATYPES: QMF32179, 32180 from QML1008, QMF33353-33357, QMF33371, 33372 from QML1005. OTHER MATERIAL: GSQF13456, from GSQF2765, JCUF12779 from JCUL810, CPC33678, from CL172, tentatively assigned to this species.

DIAGNOSIS

Small, *Kitikamispira* with flattened whorl profile between suture and first spiral row of spines.

DESCRIPTION

Small to medium, medium spired, turbiniform, gastropod up to 19mm high and 19mm wide, with an apical angle of c.50°. Whorl profile generally rounded, but flattened in the uppermost whorl surface. Whorl surface bears 5 rows of spirally arranged spines, in some specimens upon a weak thread. There is one row of spines at the edge of the subsutural shelf, two rows at the midwhorl periphery, and two on the lower whorl face. Spines are slightly elongate along the spiral cords, numerous, with approximately 14 per row per whorl; some are directed slightly abapically. Sutures slightly impressed, situated just below the midwhorl and the third row of spines, so that the spines are exposed on the flattened subsutural shoulder. The protoconch is preserved on the holotype, it consists of two unornamented volutions, the first vertically coiled and the second dextral and horizontally coiled; or "deviated paucispiral" of Knight et al. (1960). Aperture is rounded; the shell is moderately thick for its size, and appears thickened in the parietal region but the apertural region is broken in this material. Growth lines fine, strongly prosocline upon the upper whorl surface, nearly orthocline on the

midwhorl, and where preserved appear to be prosocline on the lower whorl surface.

REMARKS

This species is smaller than the type, and has a higher spire. It retains a similar arrangement of the spiral nodes, but the position of the uppermost row of spines is more apertural and the whorl profile from the suture to the uppermost row of spines is more flattened. The parietal callus, present in the type, is missing in this material. The external mould from Douglas Creek is a very poorly preserved specimen, probably conspecific with the Ukalunda material. I have examined material mentioned by Parfrey (1989) and Benedick (1993) which is certainly conspecific.

ETYMOLOGY

For the Ukalunda region.

Family PALAEOZYGOPLEURIDAE

Horný, 1955

***Hornzyga* gen. nov.**

TYPE SPECIES

Hornzyga cumilleriae sp. nov.

DIAGNOSIS

Vertical unornamented surface below the suture, generally rounded midwhorl profile bearing coarse collabral ribs.

ETYMOLOGY

For Radvan Horný.

REMARKS

Palaeozygopleura Horný seems to encompass forms with finer collabral ribs, and no shoulder, such as *Loxonema roemeri* of Whidborne (1892), and *Palaeozygopleura muoni* Tassell 1982. Linsley (1968) seems to adopt a wider view of the genus by the inclusion of the slightly coarser ribbed *Palaeozygopleura sibleyense* Linsley from the Middle Devonian Anderdon Limestone. Further latitude given to the importance of size and rib coarseness within *Palaeozygopleura* may accommodate *Loxonema scalariaeforme* Holzappel of Whidborne, 1892 and *Loxonema altacostatum* Tassell, 1982 which is anomalous within *Loxonema*. *Devonozyga* Horný, 1955 possesses a distinct shoulder and thicker ribs. *Hornzyga* is separated from both *Palaeozygopleura* and *Devonozyga* by the vertical surface below the suture, and restriction of the ornament to the wide midwhorl.



Fig. 3 A-C. *Hornyzyga camilleriae* gen. et sp. nov. A, Latex mold of holotype QMF33385, apertural view x 2.2. B, Latex mold of Paratype QMF33369, side view x2. C, Latex mold of holotype QMF33385, x 6. Note the flattened subsutural areas.

Familial placement may be considered problematic without protoconch material, following Horny (1955) and Knight et al. (1960), but seems reasonable given the gross morphological similarities.

Hornyzyga camilleriae sp. nov.
Fig. 3 A-C

DIAGNOSIS

As for genus.

MATERIAL EXAMINED

HOLOTYPE: QMF33385 from QML1005.

PARATYPES: QMF33369-70 from L1006, QMF33386 from QML1005

DESCRIPTION

Medium sized, high-spined, many-whorled, up to 30mm high and 11mm wide, with an apical angle of c.15°. Sutures adpressed, sutural slope shallow. Midwhorl surface is dominated by thick collabral ribs, approximately 12 per whorl, which are variably opisthocline. Below the suture is a vertical and unornamented surface, but the whorl profile is convex where it bears the thick ribs. There is a vertical unornamented area below these riblets upon the final whorl, and below this the lower whorl profile is smooth and rounded. The suture is situated just below the midwhorl ribs. Aperture is apparently rounded. Growth lines unknown. Protoconch unknown. The holotype is 30mm high and 10mm wide, but lacks a protoconch. Paratype QMF33369 is crushed, and QMF33370 is represented by two late whorls.

REMARKS

Loxonema altacostatum Tassell, 1982 from the Early Devonian of Taemas, New South Wales, lacks the subsutural surface of this taxon, giving the Taemas species a more rounded and even whorl profile. Tassell's species is better placed within *Palaeozygopleura*. Other ribbed *Loxonema* include *L. roemeri* Kayser of Whidborne (1892) from the Devonian of Devon, which also lacks the subsutural surface, and tends to have a more orthocline to prosocline arrangement of closely spaced riblets. *L. scalariaeformis* Holzapfel of Whidborne (1892) has more impressed sutures and also lacks the subsutural surface.

ETYMOLOGY

For Natalie Camilleri.

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APPENDIX

- QML1005 Un-named tributary of Mary Creek, 80m from creek in prominent eroded gullies, 20° 47.7' S, 147° 20.2' E, Old Hidden Valley Station. Ukalunda Beds. Collected A. Cook & N. Camilleri, 1994.
- QML1006 Un-named tributary of Mary Creek, 200m NE of L1005, section centred on 20° 47.7' S, 147° 20.3' E, Old Hidden Valley Station. Ukalunda Beds. Collected A. Cook & N. Camilleri, 1994.
- QML1008 Small un-named creek 1.5km S of 'Sugarloaf Dam', at 20° 55.4', 147° 3.8', Pyramid Station, Ukalunda Beds. Collected A. Cook & N. Camilleri, 1994.
- GSQL2765 Northern tributary of Boundary Creek, at metric grid GR 009 539, Mt Coolon 1:100 000 sheet (8355). Ukalunda Beds. Collected C. Wilkinson, 1988.
- JCUL810. Un-named creek, 1.5km west of "The Sugarloaf" at metric grid GR 068 868. Glendon 1: 100 000 sheet, Pyramid Station. Collected J. Bennedick, 1993.